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<p>(21) International Application Number: PCT/US96/06290</p> <p>(22) International Filing Date: 3 May 1996 (03.05.96)</p> <p>(30) Priority Data:</p> <table> <tr> <td>08/435,709</td> <td>4 May 1995 (04.05.95)</td> <td>US</td> </tr> <tr> <td>08/435,838</td> <td>4 May 1995 (04.05.95)</td> <td>US</td> </tr> <tr> <td>60/006,589</td> <td>10 November 1995 (10.11.95)</td> <td>US</td> </tr> </table> <p>(71) Applicant (<i>for all designated States except US</i>): INTERWAVE COMMUNICATIONS INTERNATIONAL, LTD. [-]; c/o Codan Services, Ltd., Clarendon House, 1 Church Street, Hamilton HM DX (BM).</p> <p>(71)(72) Applicant and Inventor: LU, Priscilla, Marilyn [US/US]; 718 Best Court, San Carlos, CA 94070 (US).</p> <p>(72) Inventor; and</p> <p>(75) Inventor/Applicant (<i>for US only</i>): WHITE, Timothy, R. [US/US]; 1040 Emerson Street, Palo Alto, CA 94301 (US).</p> <p>(74) Agents: NGUYEN, Joseph, A. et al.; Hickman, Beyer & Weaver, P.O. Box 61059, Palo Alto, CA 94304 (US).</p>		08/435,709	4 May 1995 (04.05.95)	US	08/435,838	4 May 1995 (04.05.95)	US	60/006,589	10 November 1995 (10.11.95)	US	<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	
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<p>(54) Title: HYBRID CELLULAR COMMUNICATION APPARATUS AND METHOD</p> <p>(57) Abstract</p> <p>a method for facilitating cellular communication for and among a plurality of native cellular handsets in a hybrid cellular communication network that has a cellular exchange subsystem and a private mobile-services switching center. In this embodiment, the cellular exchange subsystem is coupled to a public cellular network, and the native cellular handsets represent handsets that subscribe to the hybrid cellular communication network. The hybrid cellular communication network further facilitates cellular communication between a non-native cellular handset and the public cellular network, with the non-native cellular handset and the public cellular network, with the non-native cellular handset being a cellular handset that does not subscribe to the hybrid cellular communication network. In this embodiment, the method includes the steps of receiving access request data, using a cellular exchange subsystem, and ascertaining whether the access request data originates from one of the plurality of native cellular handsets or from the non-native cellular handset. If the access request data originates from the one of the plurality of native cellular handsets, the method then passes data relating to the access request to the private mobile-services switching center for completing a first call path from the one of the plurality of native cellular handsets. On the other hand, if the access request data originates from the non-native cellular handset, the method passes data relating to the access request data to the public cellular network for completing a second call path between the non-native cellular handset and the public cellular network.</p>												

When calls are always switched at the highest level of the hierarchy, call paths to and from the cordless handsets are oftentimes unnecessarily back hauled all the way to the highest level, i.e., the wPBX, although it may be more efficient to cross connect closer to the cordless handsets, i.e. at a base unit at a lower level of the hierarchy.

5 Another disadvantage of the prior art wireless PBX's relates to its inability to authenticate calling and destination handsets to ascertain whether the handsets currently in communication with the system is in fact the intended ones. This is because any prior wireless handset that happens to be on the same frequency and utilizes the same protocol as the base unit can intercept a given call. Because of this limitation, there is no way in the prior art wPBX to
10 define and discriminate among the particular handsets that are authorized to use the resources of the wireless system to make and receive calls from those that merely have the technical ability, but not authorized, to use those resources. For the purpose of the present disclosure, the former is regarded as native handsets and the latter nonnative ones.

15 It should be appreciated that in some applications, it would be desirable to provide a system which discriminates between native and nonnative handsets and permits nonnative handsets that enter an area controlled by a private exchange system to utilize the resources of that private exchange system to seamlessly connect to a public network.

SUMMARY OF THE INVENTION

20 To achieve the foregoing and other objects and in accordance with its purpose, the present invention relates, in one embodiment, to a hybrid cellular communication apparatus in a hybrid cellular communication network, which has a base station subsystem and a switch circuit, for facilitating cellular communication for and among a plurality of native cellular handsets. The hybrid cellular communication network also facilitates cellular communication
25 between a nonnative cellular handset and a public cellular network, which has a public mobile-services switching center. The nonnative cellular handset represents a cellular handset that does not subscribe to the hybrid cellular communication network.

30 In this embodiment, the apparatus includes a cellular exchange subsystem coupled to the base station subsystem and the public cellular network. In turn, the cellular exchange subsystem includes a private mobile-services switching center coupled to the switch circuit for providing mobility management for the plurality of native cellular handsets. The switch circuit represents a node wherein a bearer data channel from any of the plurality of native cellular

handsets may be cross-connected to complete a call path within the hybrid communication network.

The apparatus further includes a registry coupled to the private mobile-services switching center. The registry contains data identifying each of the plurality of native cellular handsets as handsets that subscribe to the hybrid cellular communication network, wherein the nonnative handset is not identified in the registry as a handset that subscribes to the hybrid cellular communication network. The apparatus also includes a hybrid base station controller circuit coupled to the public cellular network.

Further, the apparatus includes a circuit coupled to the registry for determining, responsive to data in the registry, whether communication data pertaining to a call received by the cellular exchange subsystem originates from one of the plurality of native cellular handsets or from the nonnative cellular handset. If the circuit determines that the communication data originates from one of the native cellular handsets, the circuit passes the communication data to the private mobile-services switching center to facilitate completion of a call path within the hybrid cellular communication network.

On the other hand, if the circuit determines that the communication data originates from the nonnative cellular handset, the circuit passes the communication data to the hybrid base station controller irrespective whether the communication data pertains to a call to one of the native cellular handsets. This passing facilitates completion of a call path to the nonnative cellular handset using mobile-services switching center resources of the mobile-services switching center in the public cellular network. In this embodiment, the hybrid base station controller functions to forward and translate communication data between the public cellular network and the base station subsystem within the hybrid cellular communication network.

In another embodiment, the invention relates to a method, in a hybrid cellular communication network which has a cellular exchange subsystem and a private mobile-services switching center, for facilitating cellular communication for and among a plurality of native cellular handsets. In this embodiment, the cellular exchange subsystem is coupled to a public cellular , and the native cellular handsets represent handsets that subscribe to the hybrid cellular communication network.

The hybrid cellular communication network further facilitates cellular communication between a nonnative cellular handset and the public cellular network, with the nonnative cellular handset being a cellular handset that does not subscribe to the hybrid cellular communication network. In this embodiment, the method includes the steps of receiving access request data, using a cellular exchange subsystem, and ascertaining whether the access request data originates from one of the plurality of native cellular handsets or from the nonnative cellular handset.

If the access request data originates from the one of the plurality of native cellular handsets, the method then passes data relating to the access request to the private mobile-services switching center for completing a first call path from the one of the plurality of native cellular handsets. On the other hand, if the access request data originates from the nonnative 5 cellular handset, the method passes data relating to the access request data to the public cellular network for completing a second call path between the nonnative cellular handset and the public cellular network.

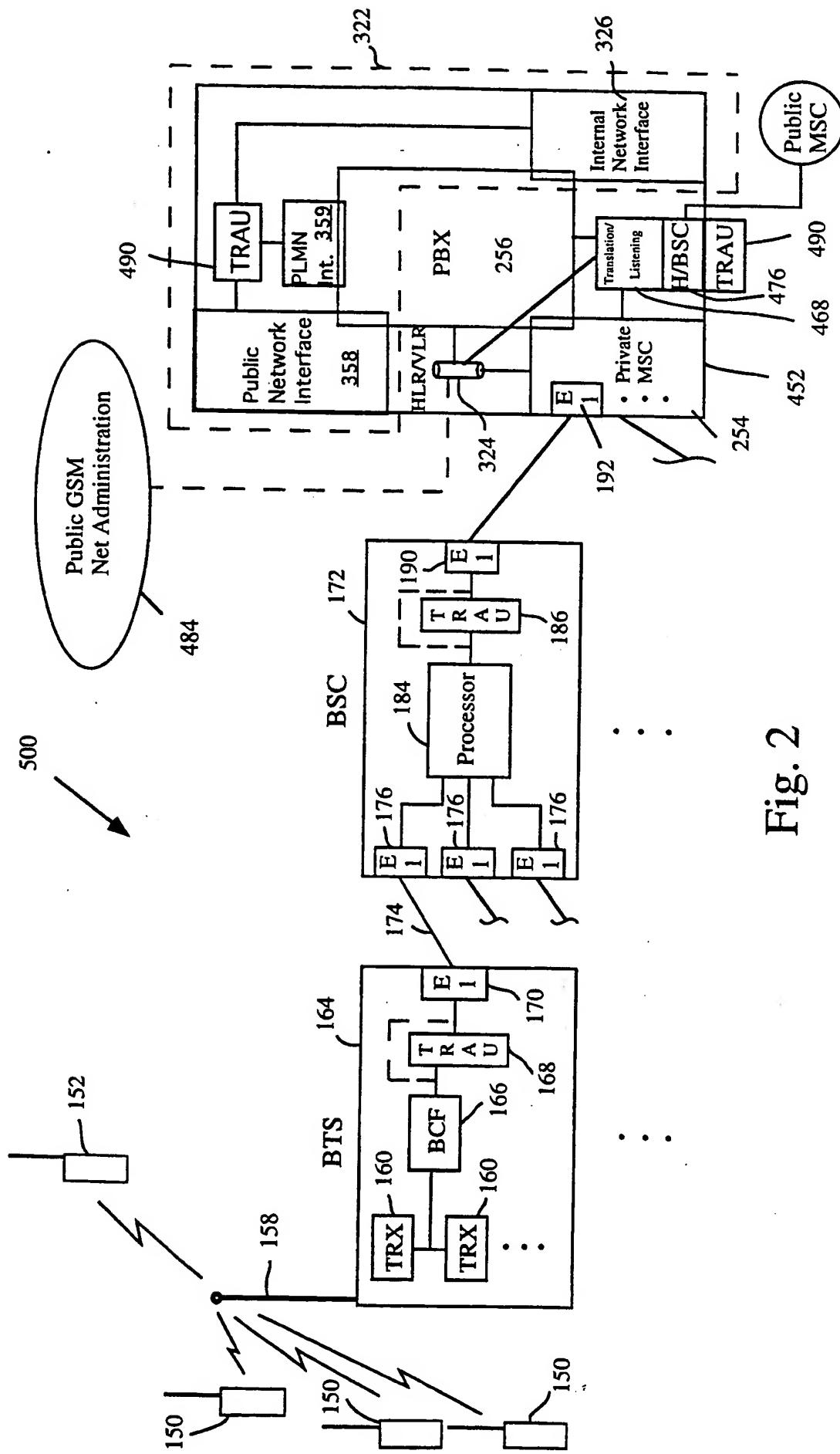


Fig. 2

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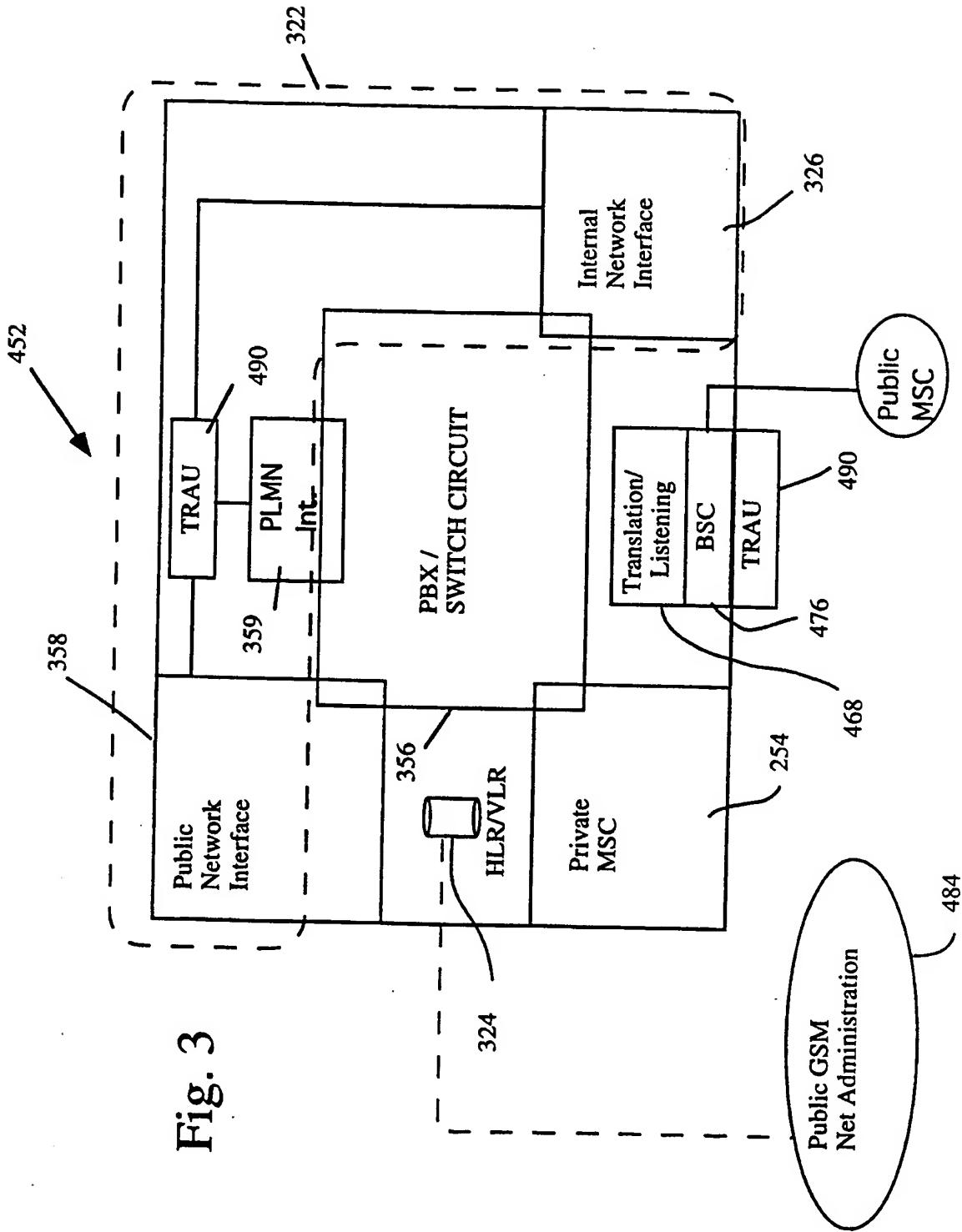
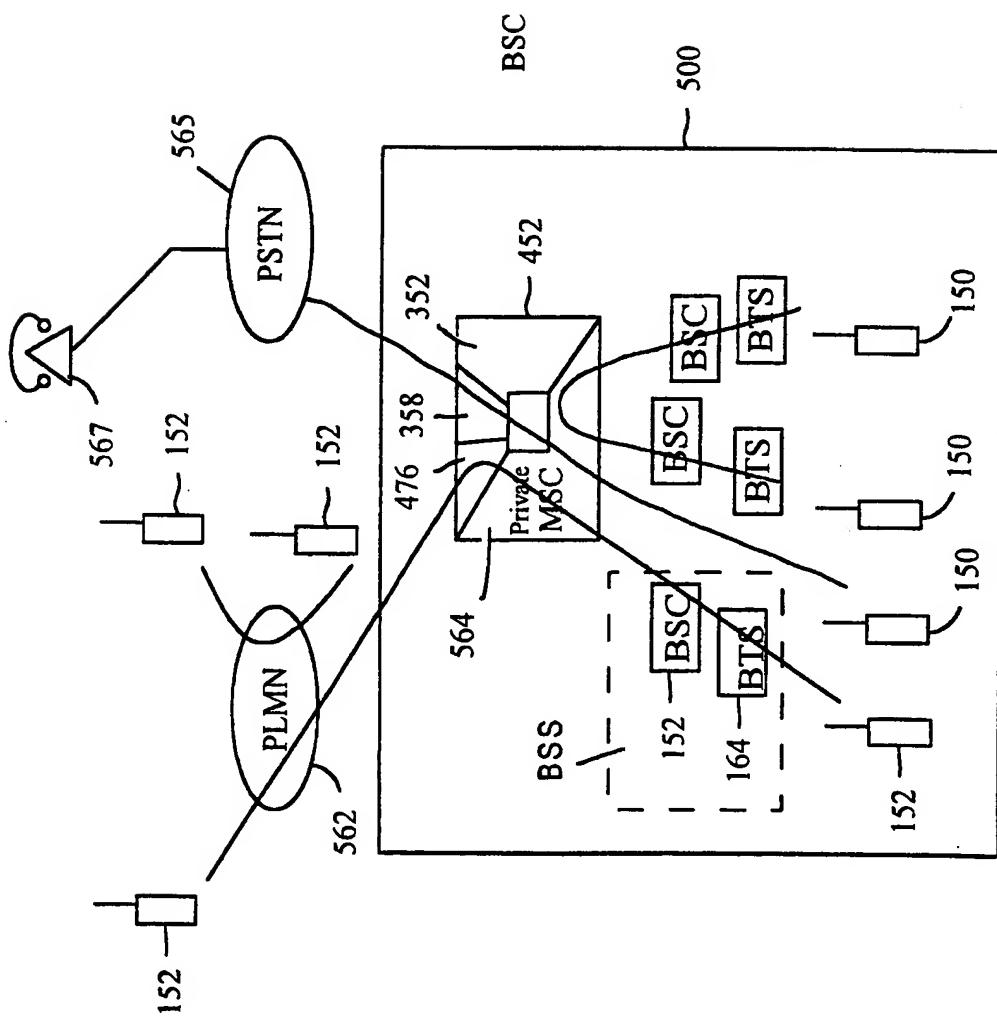


Fig. 3

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Fig. 4



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IMSI	Phone #	Name	SS#	Home Loc	Current Loc	Supplemental Services Settings	
						CPBX #1	CPBX #2
0.000.000.001	123-6020	John	123-45-6789	CPBX #1	Not Available		
0.000.000.002	123-6021	Janet	123-45-6788	CPBX #1	CPBX #1		
0.000.000.003	123-6022	Jack	123-45-6787	CPBX #1	CPBX #2		
					• •		

Figure 5

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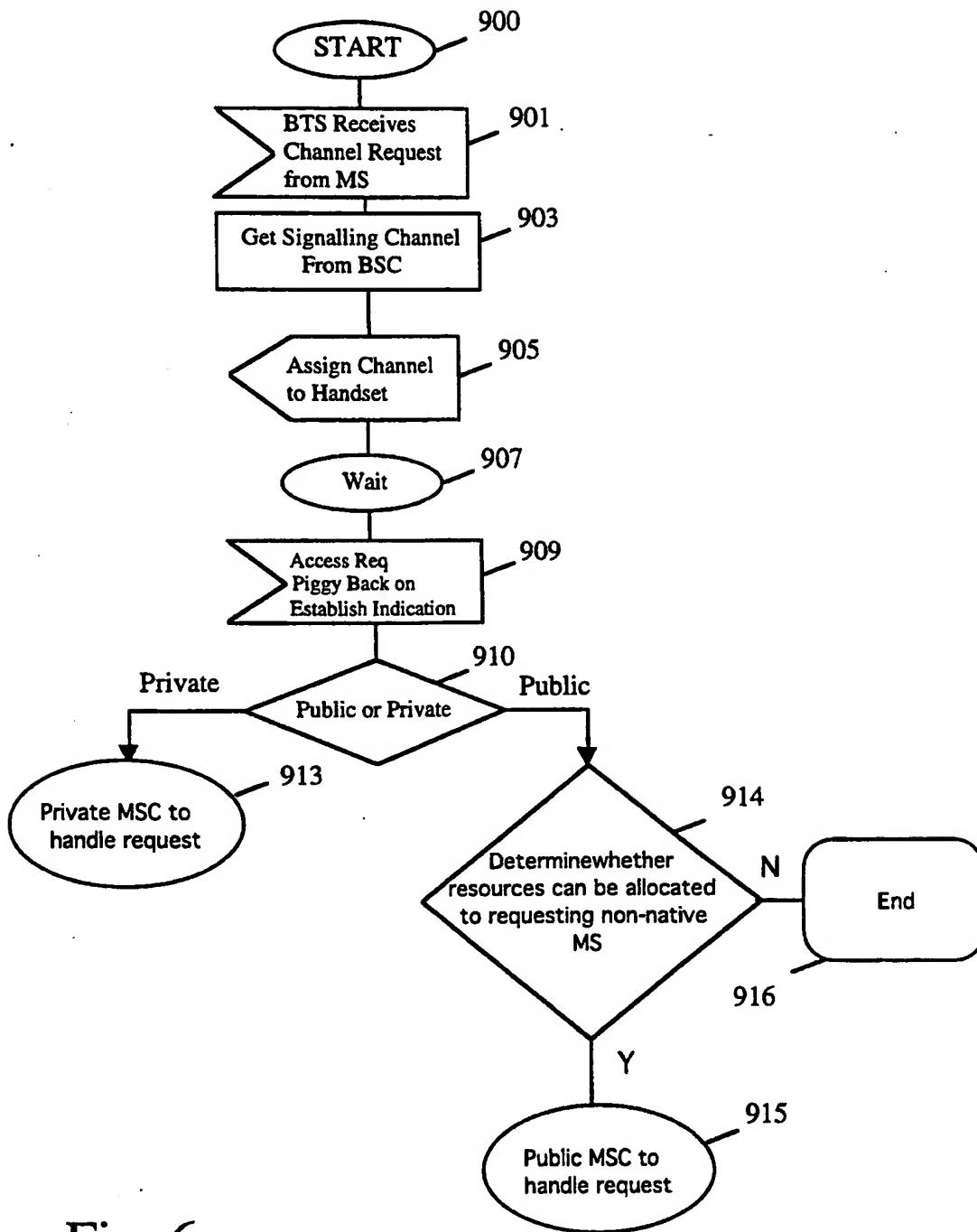


Fig. 6

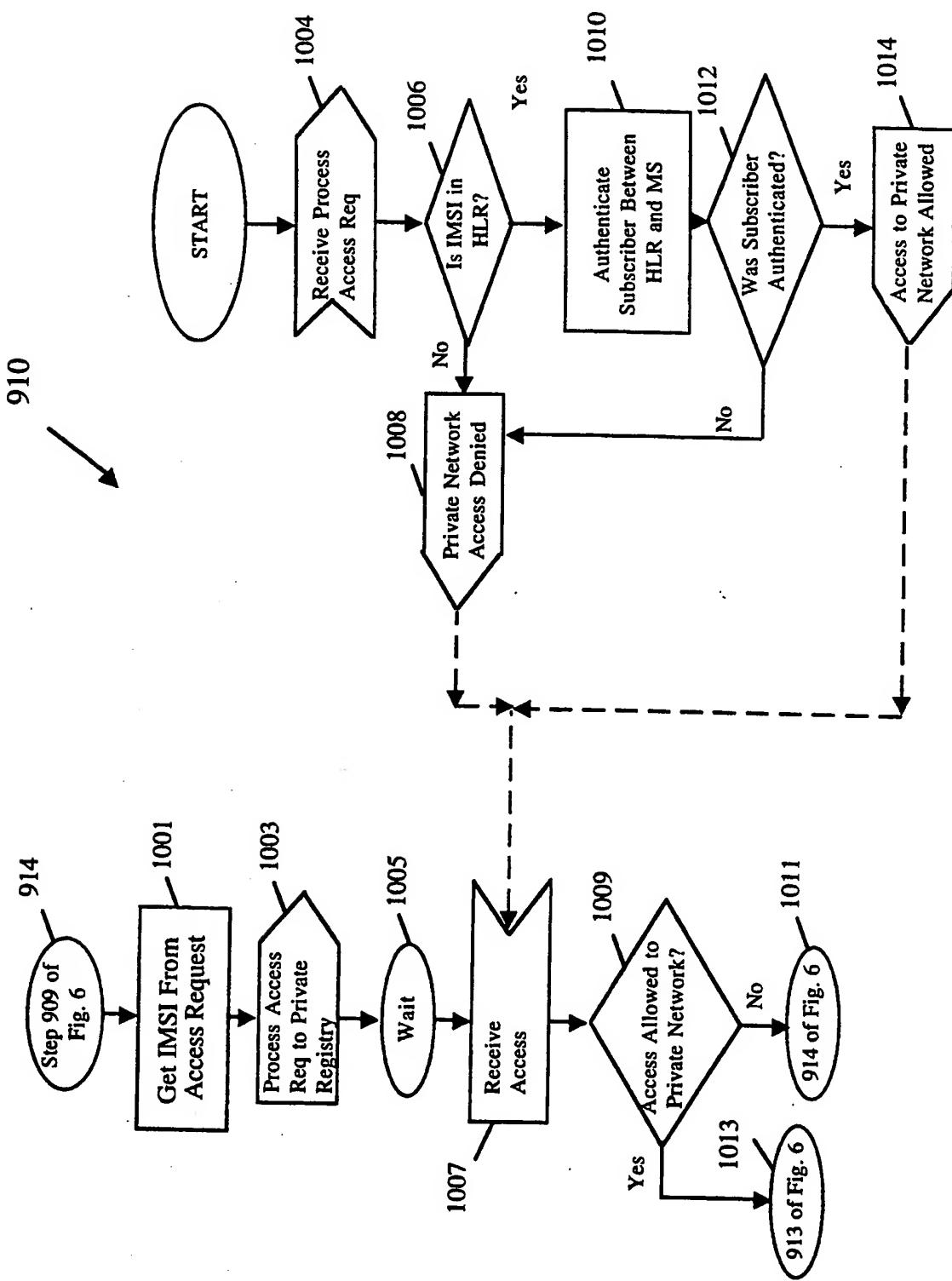


Fig. 7

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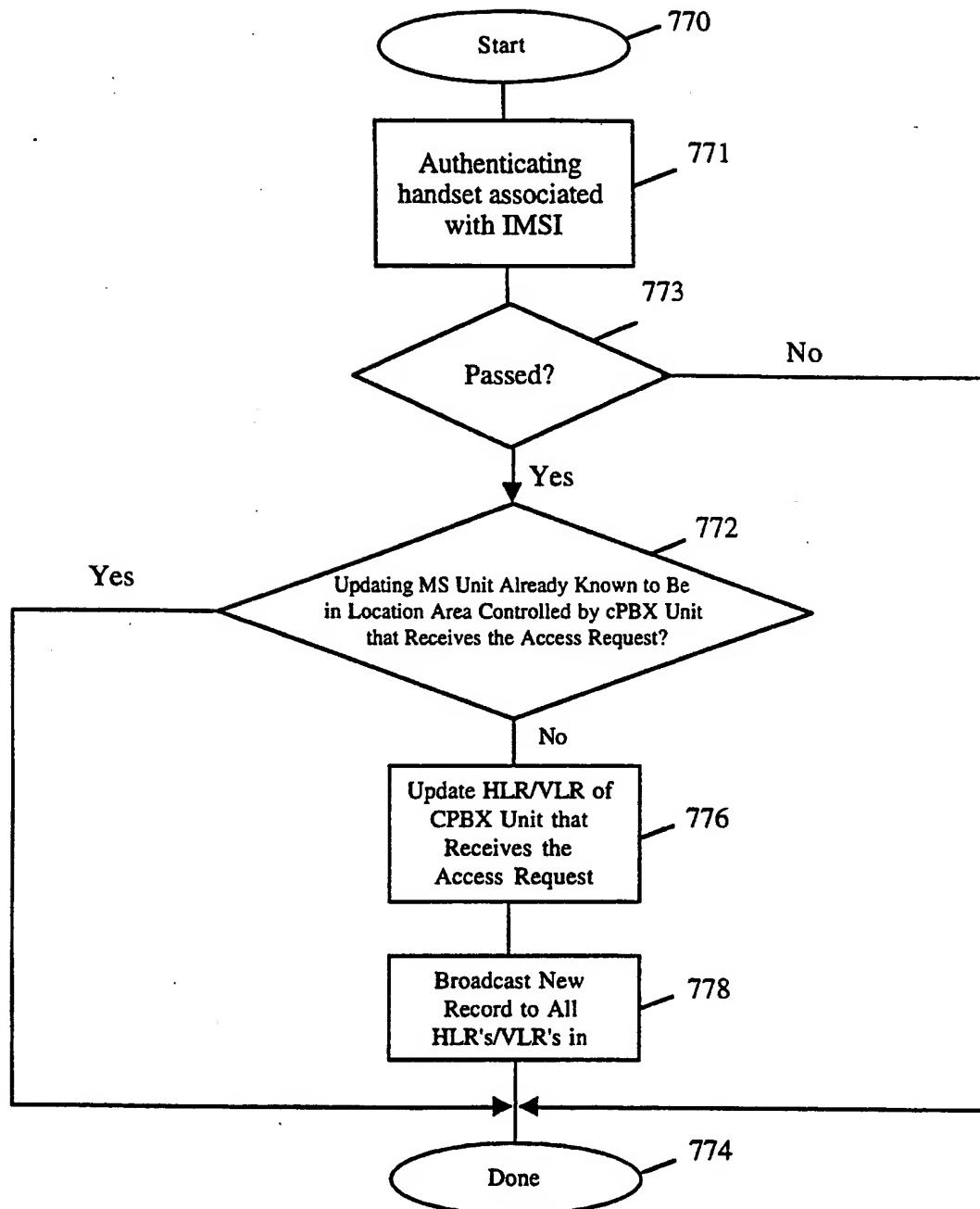


Fig. 10